

The Polyporaceae of Pennsylvania

The Genus Polyporus

Technical Bulletin



THE PENNSYLVANIA STATE COLLEGE
SCHOOL OF AGRICULTURE AND EXPERIMENT STATION
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The Polyporaceae of Pennsylvania¹

I. The Genus *Polyporus*

L. O. OVERHOLTS

THIS paper is a resumé of nearly twenty years of collecting. Many sections of the state have not yet been visited; nevertheless, the list here presented is believed to be nearly complete. A few species have been included which are most certainly to be found within the confines of Pennsylvania, since they occur in adjacent states, but have not yet been collected here. The descriptions are much abbreviated; fuller descriptions and illustrations will be presented in a manual of this family, covering the entire United States, which is in preparation.

The members of this family usually are referred to as pore fungi, but the more conspicuous sporophores are locally and colloquially known as "punks" and "conchs" to lumbermen and woodsmen. The treatment here used excludes the *Boletaceae* or "Boletes" which, in spite of the possession of tubes as in the present family, are now universally recognized as having closer affinities with certain sections of the *Agaricaceae* or "gill fungi."

Economic Importance of the Group

The lumberman, versed in the signs of the woods, knows that the appearance of one of these punks or conchs (sporophores) on a living tree means that back of such an outgrowth there will always be found a more or less extensive area of decayed wood. Those more fully versed in the subject eventually learn, not only that the punks are always associated with decay, but also that all commercially important decay of timber, whether in the heartwood of living trees, in dimension stock in storage, in structural timbers of all sorts—bridges, buildings, piling, poles, ties, and props—or in rotting stumps or logs in the woods, is caused by fungi of this or related types. Wood or lumber may weather away and disintegrate to a greater or less degree owing to the action of sun, rain, snow, freezing, and thawing; but no decay results unless the living mycelium of some fungus of this type gains entrance into the wood. Under the disintegrating influence of the enzymatic substances that all living things are able to secrete, the complex cellulose and lignin compounds of the wood are broken down and partially absorbed by the mycelium. If absorption is more or less complete, pockets or hollows result. The wood substance or its disintegration products constitute the major portion of the food necessary for these fungous organisms. In other words, the wood serves as a source of nutrition for the fungus and the more extensively the mycelium is developed the greater is the rate at which the wood is destroyed. If one could compute the worth of all timber and wood products destroyed by decay in a single year in the United States the total would no doubt be astounding; certainly it would be millions of board feet of lumber and billions of dollars in value.

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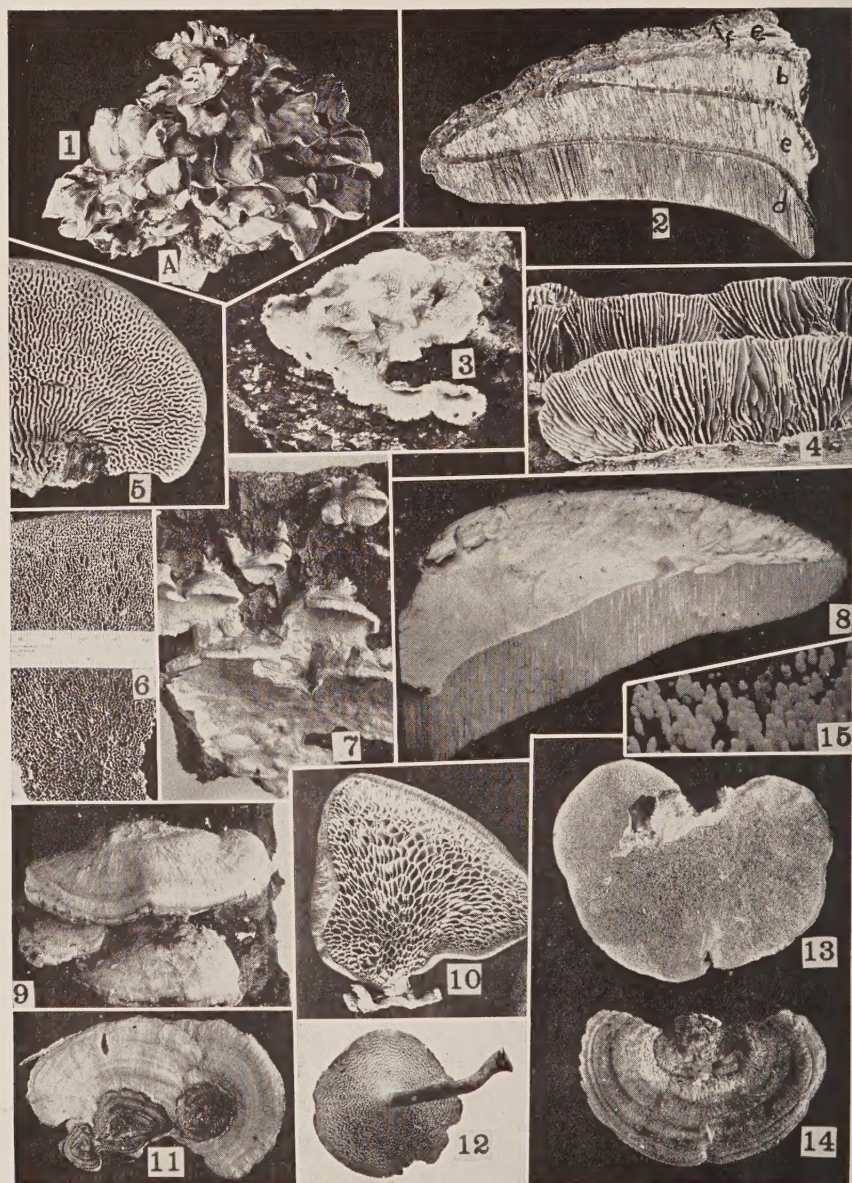


PLATE I. VARIOUS TYPES OF POLYPORUS

Fig. 1. The compound sporophore of *Polyporus frondosus*, consisting of many overlapping pilei terminating the many branches of the common stem. A. x 1/3.

Fig. 2. Perennial type of sporophore of *Fomes applanatus*, showing three annual layers of tubes, b, c, and d, the thin context, e, and a rather distinct crust, f, over the surface of the pileus. x1.

Fig. 3. Nearly resupinate sporophore of *Merulius tremellosus* showing the shallowly pitted hymenial surface. x1.

Fig. 4. The lamellate or gilled type of hymenium as shown in *Lenzites betulina*. x1.

Fig. 5. The daedaleoid type of hymenium of *Daedalea quercina*, the pores elongated and sinuous. x1.

Fig. 6. Showing method of measuring the pores of a pore fungus, *Polyporus obtusus*, by laying the edge of a millimeter ruler on the pore surface and, under a lens if necessary, reading the diameters as so many pores per mm. x 3/4.

Fig. 7. Showing the effused-reflexed or decurrent type of sporophore of *Polyporus anceps*. If the entire sporophore were flat on the substratum, as near the figure 7, the sporophore would be resupinate. x1.

Fig. 8. Lateral view of a vertical section through the sporophore of *Polyporus spumeus*. The upper half represents the context, the lower half the tubes. Note that the bases (upper ends) of the tubes all form a continuous straight line. x1.

Fig. 9. A typical sessile sporophore as seen from above. *Polyporus pubescens*. Note the slightly radiate-rugose and inconspicuously zoned upper surface of pileus. x1.

Fig. 10. A sub-stipitate sporophore of *Favolus canadensis* with large pores rather distinctly radiately arranged. x1.

Fig. 11. The thin, sessile, somewhat zonate upper surface of the pileus of *Polyporus conchifer*, bearing brown cup-like sterile structures at its base. x1.

Fig. 12. The centrally stipitate sporophore of *Polyporus arcularius*. x1.

Fig. 13. Lower surface of sporophore of *Polyporus hirsutus*, showing the small regular pores. x1.

Fig. 14. Upper surface of same, showing strongly zonate condition and the evident tomentum. x1.

Fig. 15. The isolated cylinders constituting the sporophores of a species of *Solenia*, and produced directly on the substratum. x12.

Gross Structure of the Sporophore

The simplest type of sporophore in this family consists of a series of tubes or hollow cylinders arising directly from the mycelium at the surface of the substratum (Fig. 15). In a more advanced type, known as the *resupinate* sporophore, such a series of tubes, much more closely compacted side by side, arises from an intervening and often well developed hyphal layer or *subiculum* lying flat on the substratum (Fig. 3). Here the only macroscopically distinct parts of the sporophore are tubes and subiculum. In a yet more advanced type known as the *sessile* sporophore, one edge of the subiculum layer seems to have grown directly outward from the substratum to form a *pileus* or bracket (Fig. 9). The tubes, opening always downward, occupy the lower surface of this sporophore (Figs. 5, 10, 13) and arise from a tissue intermediate in position between the tubes and the upper surface, known as the *context* (Figs. 2e, 8). This is the usual type of *bracket fungus* so common on the sides of logs, stumps, and living trees. The upper surface of such a sporophore may be variously marked with degrees of hairiness, zonation, and color variations (Figs. 9, 11, 14)—characters used in distinguishing between the various species. Occasionally this upper surface becomes covered with a hard crust (Fig. 2f), harder than the context beneath it. Such a sporophore is said to be *incrusted*. In the best developed type of sporophore in the family it assumes more or less of a toadstool shape, that is, has both a *cap* or *pileus* and a *stem* or *stalk*. Such a sporophore is said to be *stipitate* (Fig. 12). In such a sporophore the tubes are on the lower surface of the cap, opening downward, the context occupies the same relative position as in the sessile type, and the upper surface shows the same range of characters as it does in that type.

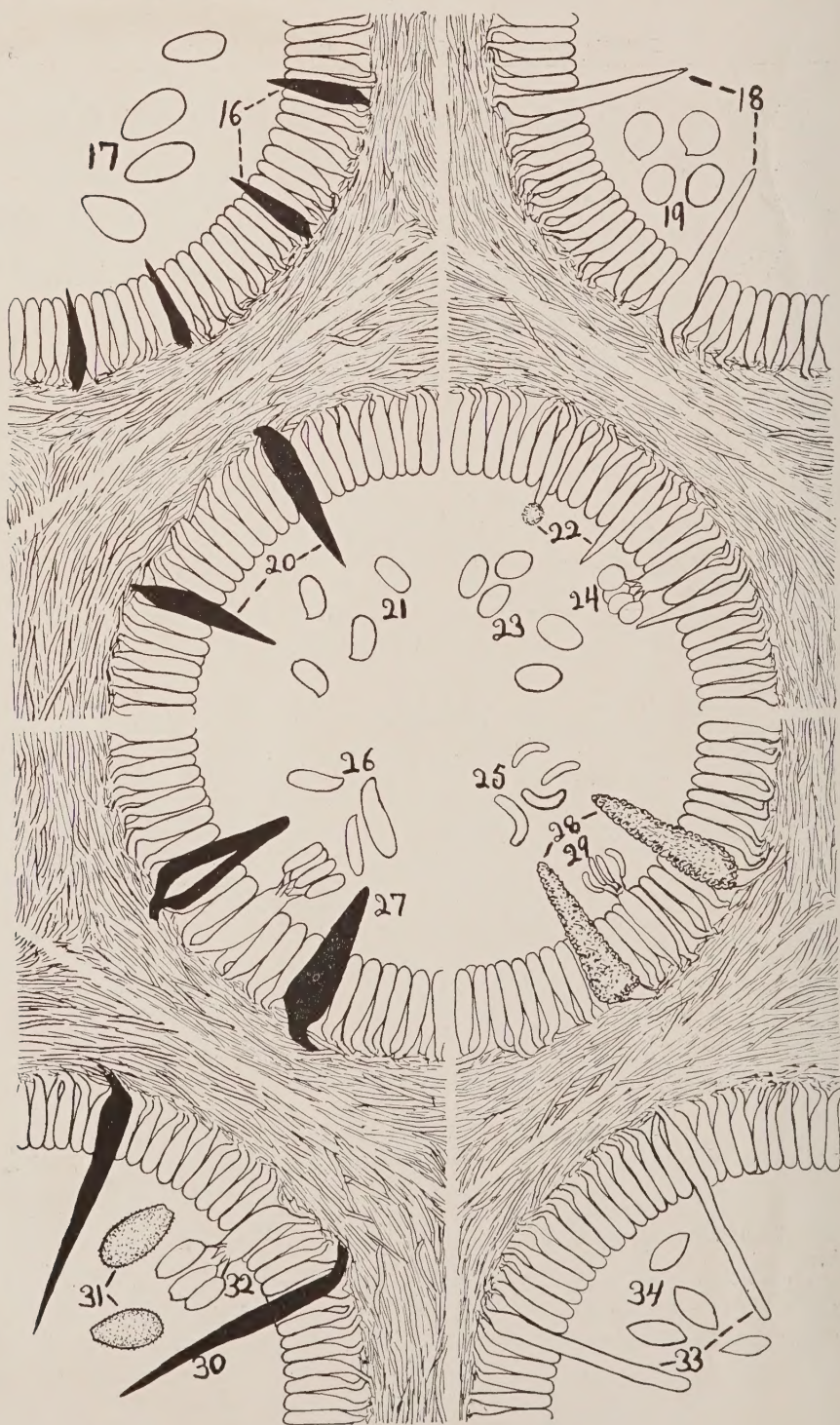


PLATE II.

PLATE II. A COMPOSITE AND HIGHLY DIAGRAMMATIC DRAWING TO SHOW A SMALL PORTION OF A CROSS SECTION OF THE TUBES TO ILLUSTRATE THE VARIOUS TYPES OF CYSTIDIA AND SETAE AND THE VARIATION IN SPORE SHAPES. HIGHLY MAGNIFIED.

Figs. 16, 20, 27 and 30 represent various types of setae some of which scarcely project at all (16), others projecting prominently (30).

Figs. 18, 22, 28, and 33 are various types of cystidia, some capitate-incrusted, (22), others heavily incrustated all over (28), and others unincrusted (18, 33).

Fig. 17, Ovoid or narrow ovoid spores; 19, globose or subglobose spores; 21, oblong-ellipsoid spores; 23, ellipsoid spores; 25, allantoid spores; 26, cylindric spores; 32, ovoid spores with a truncate apex and roughened wall; 34, elliptic spores.

Structure of the Hymenium

The hymenium is the layer of tissue that actually bears the spores. This layer always lines the tubes and is made up, for the most part, of the very essential *basidia* each of which bears typically four spores (Figs. 29, 32). In addition to the basidia there may be also in this layer certain types of sterile or non-spore producing organs, often projecting prominently into the lumen of the tube, but just as frequently less prominent and not much more conspicuous than the basidia. These are termed *cystidia* if they are colorless and *setae* if brown. To see them or the basidia one must cut very thin cross sections of the tubes and observe them under the microscope. Plate II is a composite illustration of some of the various types of setae and cystidia that may be present, as well as variations in the shape of the spores.

KEY TO THE GENERA²

1. Tubes very shallow and pit-like or crater-like, often appearing as contiguous pits separated by narrow ridges or reticulations (*Fig. 3*) . . . *Merulius*
Tubes more or less well formed and of measurable length 2
2. Growing only on the ground 3
Growing on wood 4
3. Tubes soon coalescing laterally to form a series of concentric plates or lamellae on the lower surface of the pileus *Cyclomyces*
Tubes not so coalescing *Polyporus*
4. Pileus none; sporophore consisting only of distinct tubes or cylinders, single and isolated or united at their bases into clusters on the substratum (*Fig. 15*) *Solenia*
Pileus none; sporophore consisting of tubes inseparably united side by side and produced on a thin underlying hyphal layer or subiculum, i. e. sporophore entirely resupinate (*Fig. 3*) *Poria*
Pileus present and more or less distinct 5
5. Sporophore perennial, finally composed of several or many distinct or indistinct layers of tubes (*Fig. 2*), one of which has been formed each year; mostly hard and woody fungi *Fomes*
Sporophore annual, usually with but a single layer of tubes; soft and fleshy to firm and corky but seldom woody 6
6. Hymenium daedaloid or verging toward lamellate (*Fig. 5*); sporophore always sessile, coriaceous to corky but never soft and fleshy; context always white or light colored *Daedalea*
Hymenium lamellate or gilled (*Fig. 4*) *Lenzites*
Hymenium poroid (*Figs. 6, 10, 12, 13*), or if verging toward daedaloid then with other characters than those above 7
7. Tubes not in a distinct stratum but sunk to unequal depths into the context so that their bases do not form a straight line *Trametes*
Tubes in a distinct stratum, their bases forming an unbroken straight line (*Fig. 8*) 8
8. Sporophores small, with a lateral stem-like point of attachment, the tubes arranged more or less in radiating rows (*Fig. 10*) *Favolus*
Sporophores not entirely as in the above 9
9. Pores circular to angular (*Figs. 6, 13*) *Polyporus*
Pores elongate to daedaloid (*Fig. 5*) *Lenzites*

GENUS POLYPORUS (Micheli) Fries

KEY TO THE SPECIES

- Context white, whitish, or not darker than wood-color or very light yellow; spores hyaline. SECTION I, p. 9
- Context bright-colored, pinkish, yellowish-red, orange, or saffron; spores hyaline under the microscope. SECTION II, p. 18
- Context dark, umber-brown to yellowish-brown or darker; spores hyaline or brown. SECTION III, p. 19

² Only the genus *Polyporus* is treated in this paper. The other genera will appear subsequently.

SECTION I.

Sporophore stipitate (*Fig. 12*) or sub-stipitate (*Fig. 10*), erect or pendent.

Sporophore terrestrial or growing from buried wood or from an underground sclerotium.

Pilei two to many on the branches of a common stem (*Fig. 1*).

SUB-SECTION 1, p. 9

Pileus single; stem unbranched (*Fig. 12*).

SUB-SECTION 2, p. 10

Sporophore growing on wood, above ground.

Pileus white, gray, or pallid in fresh plants, not definitely colored and scarcely changing color on drying.

SUB-SECTION 3, p. 10

Pileus definitely colored when fresh, yellow, salmon, drab, tan, brown, red, black, etc., not changing color on drying.

SUB-SECTION 4, p. 11

Sporophore sessile or effused-reflexed (*Figs. 7, 9*), not stipitate and not pendent.

Plants inhabiting coniferous wood.

Pileus definitely colored in fresh plants, salmon, orange, brown, red, black, etc., usually the same on drying.

SUB-SECTION 5, p. 12

Pileus white, pallid, or gray in fresh specimens, not definitely colored, sometimes drying yellowish, more rarely reddish, often unchanging.

Context 1 mm. or less thick.

SUB-SECTION 6, p. 12

Context more than 1 mm. thick.

SUB-SECTION 7, p. 13

Plants inhabiting wood of hardwood trees.

Pileus more than 1 cm. thick.

SUB-SECTION 8, p. 14

Pileus not more than 1 cm. thick.

Pores large, average not more than 2 per mm.

SUB-SECTION 9, p. 15

Pores smaller, averaging more than 2 per mm.

Pores averaging 2 to 4 per mm.

SUB-SECTION 10, p. 16

Pores averaging more than 4 per mm.

SUB-SECTION 11, p. 17

SUB-SECTION I.

1. Pilei few in number, often only two or three 2
Pilei many, usually 25 or more 4
2. Spores echinulate, 5.5-7.5 μ broad; pileus velvety-tomentose to glabrous *P. Berkeleyi*
Spores smooth 3
3. Pore surface blackish on drying, especially toward the edge of the pileus *P. giganteus*
Pore surface not blackish on drying *P. sulphureus* var. *cinnatus*
4. Spores globose, strongly echinulate *P. Berkeleyi*
Spores cylindric, smooth *P. umbellatus*
Spores ellipsoid to ovoid or globose, smooth 5
5. Pileus salmon-colored when fresh, sub-fleshy or cheeseey in texture *P. sulphureus* var. *cinnatus*
Pileus pallid to grayish or pale mouse-color when fresh 6
6. Pore surface blackish where bruised and on drying; context hyphae 4-8 μ diameter; pores 4 to 7 per mm *P. giganteus*
Pore surface not becoming blackish; context hyphae 6-15 μ diameter; pores 1 to 3 per mm *P. frondosus*

SUB-SECTION 2.

7. Sporophore having *all* of the characters in one of the following sets:
- a. Stem black at the base or on the lower half, but not with a black root 8
 - b. Stem not black on the above-ground portion but with a black radiating root; spores sub-fusiform *P. radicatus*
 - c. Stem not at all black; spores globose, echinulate, 5-7.5 u diameter *P. Berkeleyi*
- Sporophore *not having* all of the characters in any of the above groups 9
8. Pores averaging 5 to 7 per mm.; spores 6-8x3-4 u; pileus typically tan or chestnut, glabrous or essentially so *P. picipes*
 Pores averaging 2 to 4 per mm.; spores 8-12x3-4 u; pileus hair-brown, velvety-scurfy or almost scaly *P. melanopus*
9. Context distinctly duplex in texture, soft above, firm next the tubes, or sporophore much aborted and everywhere porous *P. distortus*
 Context not distinctly duplex 10
10. Pileus bluish or pale indigo when fresh *P. caeruloporus*
 Pileus whitish or grayish when fresh 11
 Pileus yellowish-green, areolate *P. cristatus*
11. Spores tuberculate, 5-6x4-5 u; context hyphae without cross walls *P. griseus*
 Spores smooth, 3.5-4x2-3.5 u; context hyphae with cross walls *P. ovinus*

SUB-SECTION 3.

12. Pilei two to many on the branches of a common stem, forming a compound sporophore (*Fig. 1*) 13
 Pilei single, stem unbranched (*Fig. 12*) 14
13. Pore surface blackish where bruised and on drying; hyphae of context 4-8 u diameter; pores 4 to 7 per mm.; cystidia none; pileus nearly glabrous *P. giganteus*
 Pore surface not becoming blackish; hyphae of context 6-15 u diameter; pores 4 to 7 per mm.; cystidia none; pileus nearly glabrous *P. frondosus*
 Pore surface not blackening; hyphae 4-9 u diameter; pores 2 to 3 per mm.; cystidia present; pileus hispid-tomentose *P. borealis*
14. Stem definitely lateral or not well developed (*Fig. 10*) 15
 Stem central or sub-central 21
15. Context duplex 16
 Context uniform or nearly so 17
16. Surface of pileus drying rough-tomentose; usually on wood of coniferous trees *P. borealis*
 Surface of pileus drying smooth or velvety; on wood of hardwood trees *P. distortus*
17. Growing on wood of coniferous trees 18
 Growing on hardwoods 19
18. Pileus 1-5 mm. thick, radiately fibrillose, not spotted; spores ellipsoid, 3-4x2-3 u *P. floriformis*
 Pileus 5-15 mm. thick, glabrous or nearly so, marked with circular depressed spots; spores oblong or short-cylindric, 3-4.5x2-2.5 u *P. guttulatus*
 Pileus 3-20 mm. thick, silky to glabrous, not spotted; spores allantoid or cylindric-oblong, 4-6x2-2.5 u *P. osseus*

19. Pileus thin and conchiform, bearing a cup-like sterile body at its base (Fig. 11), found only on dead elm branches; pores averaging 2 to 3 per mm. *P. conchifer*
Not entirely as in the above 20
20. Stem distinct, usually terete; pileus azonate, not drying resinous or cartilaginous See *Favolus rhipidium*
Stem only a lateral prolongation of the pileus; pileus drying resinous or horny-cartilaginous *P. semisupinus*
21. Pileus conspicuously scaly; pores 1-2.5 mm. broad *P. squamosus*
Pileus not scaly; pores less than 1 mm. broad 22
22. Context conspicuously duplex *P. distortus*
Context uniform or nearly so 23
23. Pileus less than 4 cm. broad See *Favolus rhipidium*
Pileus more than 4 cm. broad 24
24. Pores averaging 1 to 2 per mm.; sporophore soft and sub-fleshy *P. fagicolus*
Pores averaging 3 to 5 per mm.; sporophore tough or leathery *P. admirabilis*

SUB-SECTION 4.

25. Pileus and stem, or at least the latter, covered with a reddish, yellowish, or mahogany-colored varnish, usually shining and forming a thin crust 26
Pileus and stem not both varnished and not shining 27
26. Context brownish throughout, though paler above; on or about stumps or trunks of hardwood trees *P. lucidus*
Context pallid or nearly white throughout, slightly brownish on the lower half; on wood of coniferous trees *P. Tsugae*
27. Sporophore small and pendent, less than 1 cm. high *P. poculus*
Sporophore larger, or if approaching the above size, not pendent 28
28. Pilei two to many on the branches of a common tubercular stem (Fig. 1) 29
Pilei single; stem unbranched 30
29. Pileus salmon-color to yellow or orange in fresh plants, fading on drying *P. sulphureus* and var. *cinnatus*
Pileus gray to pale mouse-color, unchanged on drying *P. frondosus*
30. Sporophore having all of the characters in one of following sets:
a. Context duplex; spores oblong-ellipsoid or broadly ellipsoid, 5-7.5x3-5 u *P. distortus*
b. Pileus strongly convex, the margin projecting downward 5 mm. or more beyond the level of the pore surface; found only on birches *P. betulinus*
c. Stem entirely black or black on the lower half 31
Sporophore not showing all of the characters in any of the above groups 33
31. Pores large, 1-2.5 mm. broad *P. squamosus*
Pores small or minute, averaging 3 to 8 per mm. 32
32. Pileus tan or ochraceous, 1.5-7 cm. broad *P. elegans*
Pileus bay, tan, or chestnut, 6-20 cm. broad *P. picipes*
33. Growing only on wood of coniferous trees; pileus never spotted; context usually drying hard and horny; spores 4-6x2-2.5 u *P. osseus*
Growing on wood of hardwood trees 34

34. Pores medium-sized or large, averaging not more than 3 per mm. 35
 Pores minute, averaging 4 to 8 per mm. 39
35. Tubes long-decurrent on the stem; spores 10-14 μ long *P. fagicolus*
 Tubes slightly or not at all decurrent on the stem or stem nearly obsolete; spores 8-9 μ or less long 36
36. Pores averaging 1 mm. or more in longest direction, usually somewhat radiating outward from the stem (*Figs. 10, 12*) 37
 Pores smaller and not markedly radiating 38
37. Stem well developed, usually central *P. arcularius*
 Stem very short or rudimentary, usually lateral (*Fig. 10*) See *Favolus canadensis*
38. Pileus dark colored, unchanged on drying, more than 2.5 cm. diameter; stem central or excentric *P. brumalis*
 Pileus white or whitish, often drying reddish, less than 2.5 cm. diameter
 See *Favolus rhipidium*
39. Sporophore with a central or sub-central stem *P. brumalis*
 Sporophore with a lateral stem or with only a stem-like base (*Fig. 10*) 40
40. Stem cylindric, well developed but small See *Favolus rhipidium*
 Stem not well developed and present only as a stem-like base to the pileus *P. semisupinus*

SUB-SECTION 5.

41. Sporophore 1 cm. or more thick 42
 Sporophore less than 1 cm. thick 43
42. Pileus yellow, salmon-colored or orange when fresh, 8 cm. or more broad *P. sulphureus* and var. *cinnatus*
 Pileus seal-brown to blackish-brown; 8 cm. or more broad *P. resinosus*
 Pileus white when fresh, drying rufescent, less than 8 cm. broad *P. fragilis*
43. Sporophore soft and watery when fresh *P. fragilis*
 Sporophore tough and coriaceous or leathery when fresh 44
44. Pileus distinctly and uniformly brown or blackish-brown, particularly in fresh plants 45
 Pileus gray, cinereous, or tinged with brown or other colors but not uniformly brown or blackish *P. versicolor*
45. Pileus 1 cm. or less long; sporophore mostly resupinate 46
 Pileus more than 1 cm. long; sporophore usually not much resupinate
P. balsameus
46. Pores averaging 1 to 2 per mm.; tubes 1-3 mm. long .. See *Trametes variiformis*
 Pores averaging 3 per mm.; tubes 2.5-5 mm. long See *Trametes serialis*

SUB-SECTION 6.

47. Pileus strongly pubescent 48
 Pileus less markedly pubescent or glabrous 50
48. Pores averaging 1 to 2 or less per mm. See *Trametes sepium*
 Pores averaging 2 to 4 per mm. 49
49. Pileus watery-soft when fresh; hyphae of context with clamp connections; pore surface usually orange *P. amorphus*
 Pileus tough and leathery when fresh; hyphae without clamps; pore surface never orange *P. abietinus*

50. Pileus strongly zonate (*Fig. 14*) *P. balsameus*
 Pileus not strongly zonate 51
51. Pores 1 to 2 per mm. 52
 Pores 3 to 4 per mm. 53
52. Context hyphae very irregular and branched; sporophore watery-tough,
 drying yellowish; spores 4-6x1.5 u *P. undosus*
 Context hyphae regular, sparingly branched or simple; sporophore leath-
 ery or corky; spores 9-11x4-4.5 u See *Trametes sepium*
53. Context hyphae with abundant clamps; sporophore soft and watery;
 spores 3-5x1-1.5 u *P. fragilis*
 Context hyphae without clamps; sporophore tough or leathery; spores
 5-8x2-3 u See *Trametes serialis*

SUB-SECTION 7.

54. Pore surface orange to brick-red or reddish-purple, the tubes waxy or
 fleshy-gelatinous 55
 Pore surface not so colored and not at all waxy or gelatinous 56
55. Pores 3 to 4 per mm. *P. amorphus*
 Pores 6 to 7 per mm. *P. dichrous*
56. Pileus with scattered depressed circular spots *P. guttulatus*
 Pileus not so marked 57
57. Entire sporophore becoming pinkish, reddish, or tawny on drying ... 58
 Sporophore not so changing color 59
58. Pileus with an erect short-hispid pubescence; spores 7-9 u long ... *P. lapponicus*
 Pileus with a soft appressed tomentum; spores 3-5 u long *P. fragilis*
59. Pores averaging 1 to 2 per mm. 60
 Pores averaging 3 or more per mm. 61
60. Pore surface white, the pores irregular and elongated See *Trametes heteromorpha*
 Pore surface pallid but not white, the pores regular See *Trametes sepium*
61. Pileus glabrous or only inconspicuously pubescent 62
 Pileus definitely and usually strongly pubescent, at least under a lens.. 64
62. Pileus narrowly attached by an attenuated base 63
 Pileus broadly attached, not attenuate to a narrow base (*Fig. 7*)... *P. anceps*
63. Pileus less than 0.5 cm. thick *P. floriformis*
 Pileus 0.5 cm. or more thick *P. osseus*
64. Pileus distinctly zonate (*Fig. 14*) 65
 Pileus azonate 66
65. Pileus fibrillose, soft or cartilaginous when fresh; pore surface white
 or yellowish *P. balsameus*
 Pileus velvety-tomentose, leathery when fresh; pore surface black or
 blackish *P. adustus*
66. Spores ellipsoid or ovoid, 5-7x4-5 u; cystidia 7-10 u diameter *P. borealis*
 Spores ellipsoid or cylindric, 3-5 u long 67
67. Sporophore narrowly attached by the attenuate base of the pileus;
 spores 3-4x2.5-3 u *P. floriformis*
 Sporophore broadly attached 68

68. Pileus more than 1 cm. thick; spores short-cylindric, 3-4x1-2 μ , not
allantoid *P. immitus*
Pileus less than 1 cm. thick; spores allantoid 3-5x0.75-1 μ *P. caesius*

SUB-SECTION 8.

69. Pileus covered by a red or mahogany varnish; spores pale brown,
truncate at one end, apparently echinulate *P. lucidus*
Pileus not red-varnished; spores hyaline, smooth 70
70. Pileus bright yellow or orange; pore surface sulphur-yellow *P. sulphureus*
Pileus and pore surface differently colored in fresh specimens 71
71. Pileus strongly convex, the sterile margin projecting downward 5 mm.
or more beyond the level of the pore surface *P. betulinus*
Pileus plane to somewhat convex, without downward projecting sterile
margin 72
72. Pileus uniformly seal-brown to blackish-brown *P. resinus*
Pileus not uniformly so colored 73
73. Pore surface gray-smoke-color or black in dried plants 74
Pore surface white to gray, yellowish, or flesh-color 75
74. Tubes separated from the context by a narrow black line *P. fumosus*
Tubes not so separated from the context See *Trametes suaveolens*
75. Pores relatively large, averaging not more than 2 per mm. 76
Pores smaller, averaging 3 to 8 per mm. 79
76. Sporophore leathery when fresh and soaking up to that condition from
the dried state; context hyphae without clamps 77
Sporophore soft and watery when fresh and soaking up to that condition
from the dried state; context hyphae with clamps 78
77. Sporophore mostly resupinate (*Fig. 3*) the pileus never exceeding 2 cm.
long; largest context hyphae 3-5 μ diameter; pores circular or
angular See *Trametes malicola*
Sporophore usually not at all resupinate (*Fig. 9*), the pileus usually
larger; largest context hyphae 8-9 μ or more diameter; pores often
partly daedaloid See *Daedalea confragosa*
78. Pores 0.5-1 mm. diameter; pileus applanate, with a thin margin .. *P. delectans*
Pores 1 mm. or more diameter; pileus convex with an obtuse margin *P. obtusus*
79. Context white or nearly so 81
Context not entirely white, but pale flesh-color, pale pink, or pale buff 80
80. Sporophore corky, growing only on stumps and trunks of ash; hyphae
without clamps See *Fomes fraxineus*
Sporophore soft and watery, shrinking greatly on drying; hyphae
with clamps; not on ash trees *P. fissilis*
81. Clamp connections absent from the hyphae of the context 82
Clamp connections present on the hyphae 84
82. Incrusted cystidia present in the hymenium; usually on maple trees
..... See *Fomes connatus*
Incrusted cystidia none; usually on oak or locust, occasionally on other
hosts 83

83. Sporophore nodulose, with disagreeable odor; context hyphae 3-5 u diameter *P. compactus*
 Sporophore applanate, with pleasant odor; context hyphae up to 10 u or more diameter *P. robiniophilus*
84. Pileus strongly villose-tomentose to hispid-tomentose (*Fig. 14*), usually drying with a rough upper surface 85
 Pileus somewhat villose-tomentose to glabrous, usually drying smooth .. 89
85. Spores short-cylindric, not curved, 3-4x1-2 u; pileus drying hard and rough; pore surface never with a bluish tinge; pores 5 to 6 per mm. *P. immitus*
 Spores ellipsoid to globose 86
86. Pores averaging 4 to 6 per mm.; spores ellipsoid, minute, 2.5-3.5x2-3 u; sporophore with a pleasant odor when fresh *P. galactinus*
 Pores averaging 2 to 4 per mm.; spores larger; no pleasant odor 87
87. Spores 3-4.5 u diameter *P. spumeus* var. *maliculus*
 Spores 5-7 u in length 88
88. Context uniform in consistency, drying hard; sporophore with a strong unpleasant odor; context hyphae 3-4 u diameter *P. Spraguei*
 Context duplex, not drying unusually hard; sporophore not with disagreeable odor; context hyphae up to 6 or 8 u diameter *P. spumeus*
89. Tube layer separated from the context by a narrow dark line; sporophore tough or leathery; spores ellipsoid *P. fumosus*
 Tube layer not so separated; sporophore soft and watery; spores allantoid 90
90. Context hyphae very much branched; tubes usually only 1.5-3 mm. long *P. albellus*
 Context hyphae nearly or entirely unbranched; tubes usually 5-15 mm. long *P. tephroleucus*

SUB-SECTION 9.

91. Pileus fleshy-tough when fresh; pore surface reddish or becoming so on drying; tubes reduced to shallow pits separated by obtuse ridges
 See *Merulius tremellosus*
 Pileus tough to woody; pore surface not reddish or only slightly pinkish where rubbed; tubes of appreciable length 92
92. Pileus glabrous or only inconspicuously pubescent or tomentose 93
 Pileus conspicuously fibrillose, hirsute, or tomentose (*Fig. 14*) 96
93. Pileus always less than 3 cm. long, often mostly resupinate (*Fig. 7*) .. 94
 Pileus more than 3 cm. long, usually not partly resupinate,
 See *Daedalea confragosa*
94. Pileus dark brown or blackish See *Trametes mollis*
 Pileus lighter in color 95
95. Context 1.5 mm. or less thick; pileus, pores, and context white or nearly so; spores 9-11 u long See *Trametes sepium*
 Context 2-5 mm. thick; pileus, pores, and context not white but pale wood-color; spores 7-9 u long See *Trametes malicola*

96. Heavily incrustated cystidia conspicuous in the hymenium; clamp connections absent from context hyphae *P. tulipiferus*
 Capitately-incrustated inconspicuous cystidia present in the hymenium; clamp connections present on the context hyphae *P. pargamensis*
 Cystidia none; clamp connections at least on the smaller hyphae 97
97. Pileus 1 cm. or more long; spores 9-11x4-4.5 u; basidia 6-8 u diameter; tubes not breaking up into teeth; associated with a brown cubical rot of the wood See *Trametes sepium*
 Pileus usually more than 1 cm. long; spores 7-8x2-2.5 u; tubes usually soon breaking up into teeth; causing a white rot of the wood ... *P. biformis*

SUB-SECTION 10.

98. Sporophore very watery and somewhat fragile when fresh, not capable of much bending without breaking and soaking up soft and spongy or sodden from the dried condition; context friable, not fibrous .. 99
 Sporophore tough or leathery when fresh, bending nearly double without breaking, and soaking up to the same condition from dried specimens; context fibrous and stringy 103
99. Sporophore nodulose, never forming a well-developed pileus; odor of rancid lard *P. compactus*
 Sporophore better developed; odor different if any 100
100. Pileus strongly tomentose to pubescent 101
 Pileus inconspicuously tomentose or glabrous 102
101. Pileus drying soft, less than 5 cm. long; spores allantoid, 3-5x0.7-1 u *P. caesius*
 Pileus drying hard and usually rough, more than 5 cm. long; spores ellipsoid or ovoid, 5-7x4-6 u *P. Spraguei*
102. Hyphae of context much branched; tubes 1.5-3 mm. long *P. albellus*
 Hyphae of context simple or sparingly branched; tubes usually 5-15 mm. long *P. tephroleucus*
103. Pileus covered with a red varnish, forming a thin crust; spores ovoid, pale brown, apparently echinulate *P. lucidus*
 Pileus not varnished and usually not at all red; spores different 104
104. Tubes separated from the context by a narrow dark line *P. fumosus*
 Tubes not so separated from the context 105
105. Pileus nearly or quite glabrous when mature 106
 Pileus velvety to hirsute, hispid, fibrillose, or tomentose, at least in part (Fig. 14) 108
106. Pileus bearing a brown, cup-shaped structure at its base on the upper surface (Fig. 11); found only on dead elm branches *P. conchifer*
 Pileus not as above; usually on other hosts 107
107. Sporophore mostly resupinate (Fig. 3); pileus not more than 1 cm. long brown in color See *Trametes serialis*
 Sporophore not mostly resupinate; pileus usually more than 1 cm. long *P. pubescens* var. *Grayii*.
108. Pileus entirely white when fresh, sometimes yellowish on drying ... *P. pubescens*
 Pileus distinctly gray, cinereous, smoky, brownish, etc., but not entirely white when fresh, unchanging on drying 109

109. Pileus azonate, covered with erect, grayish to brownish, hispid to hirsute pubescence See *Trametes Troglia*
 Pileus zonate (Fig. 14), the pubescence hirsute-tomentose to velvety-tomentose, but not of erect hispid hairs 110
110. Context less than 1 mm. thick 111
 Context more than 1 mm. thick 117
111. Pileus marked with many zones, often of contrasting colors 112
 Pileus zonate but not with multi-colored zones 113
112. Pileus villose to velvety-pubescent; pore surface never strongly toothed
P. versicolor
 Pileus villous to velvety; pore surface soon strongly toothed *P. pargamensis*
 Pileus strongly hirsute-pubescent; pore surface becoming strongly toothed See *Daedalea unicolor*
113. Pore surface soon breaking up into teeth 114
 Pore surface not becoming toothed 115
114. Pileus 1-7 cm. long; cystidia slightly capitate-incrusted *P. pargamensis*
 Pileus not more than 1 cm. long; cystidia heavily incrusted *P. tulipiferus*
115. Pore surface more or less smoky; no cystidia *P. hirsutus*
 Pore surface white, whitish, or lavender-tinted; cystidia present 116
116. Pileus 1-7 cm. long; cystidia capitate-incrusted *P. pargamensis*
 Pileus less than 1 cm. long; cystidia heavily incrusted *P. tulipiferus*
117. Pileus velvety-tomentose; no cystidia *P. velutinus*
 Pileus velvety-tomentose; with small capitate-incrusted cystidia .. *P. pargamensis*
 Pileus hirsute-tomentose (Fig. 14) *P. hirsutus*

SUB-SECTION 11.

118. Pore surface pinkish or rose; hyphae without cross walls or clamps,
 See *Fomes fraxineus*
 Pore surface reddish or purplish; hyphae with clamps and cross walls,
P. dichrous
 Pore surface white to smoke-color or blackish in fresh plants, sometimes yellowish on drying, never bright colored 119
119. Sporophore when fresh soft, fleshy-fragile, watery, not bending without breaking and soaking up to a similar condition from dried specimens 120
 Sporophore tough and flexible when fresh, bending nearly double without breaking, or somewhat corky 122
120. Odor sweet and pleasant when fresh; context drying soft 121
 Odor not characteristic; context drying hard *P. immitus*
121. Spores ellipsoid or subglobose, 2.5-3.5x2-2.5 u; pileus gray in color, unchanged on drying *P. fumidiceps*
 Spores allantoid, 3-5x0.7-1 u; pileus white or slightly gray, sometimes drying yellowish *P. tephroleucus*
122. Pileus conspicuously pubescent or tomentose (Fig. 14) 123
 Pileus minutely and inconspicuously pubescent 126
123. Pore surface black or blackish *P. adustus*
 Pore surface not at all black 124

124. Pileus azonate; context hyphae with cross walls See *Fomes connatus*
 Pileus zonate (*Fig. 14*); context hyphae without cross walls 125
125. Sporophore mostly resupinate (*Fig. 3*); pileus definitely brown in color
 and with a narrow black line underlying the pubescence; context
 hyphae not over 4.5 μ diameter *P. planellus*
 Sporophore usually not mostly resupinate, and pileus never definitely
 brown in color and with no black line under the pubescence; con-
 text hyphae reaching 7 μ or more in diameter *P. versicolor*
126. Pileus more than 0.5 cm. thick 127
 Pileus 0.5 cm. or less thick 129
127. Context hyphae with clamps; pore surface usually smoky or blackish .. 128
 Context hyphae without clamps; pore surface not smoky .. See *Fomes scutellatus*
128. Pores averaging 6 to 8 per mm. *P. adustus*
 Pores averaging 3 to 5 per mm. *P. fumosus*
129. Pore surface smoky or blackish 130
 Pore surface white or whitish or drying yellowish 131
130. Pores averaging 3 to 5 per mm. *P. fumosus*
 Pores averaging 6 to 8 per mm. *P. adustus*
131. Pileus soon black on the older portions, the margin remaining white
 See *Fomes scutellatus*
 Pileus drying white, yellowish, or bay, never becoming blackish ... 132
132. Hyphal pegs broadly conoidal in form; spores 2.5-3x2-2.5 μ ... *P. semisupinus*
 Hyphal pegs narrow and sub-cylindric; spores 2.5-3.5x0.5-0.75 μ *P. semipileatus*

SECTION II.

1. Pileus and pore surface deep red (but pileus soon fading) 2
 Pileus and pore surface not deep red (one or the other rosy or orange
 in some species) 3
2. Usually on wood of coniferous trees; hymenium with cystidia; soft and
 brittle in texture *P. fibrillosus*
 Usually on wood of hardwood trees; tough and leathery in texture;
 hymenium without cystidia *P. cinnabarinus*
3. Pore surface bright yellow in fresh plants; pileus orange or salmon,
 glabrous *P. sulphureus*
 Pore surface not yellow; pileus not orange 4
4. Pileus corky when fresh, flexible 5
 Pileus soft and watery when fresh, not flexible; on wood of hardwood
 trees 6
5. Growing on wood of coniferous trees See *Fomes sub-roseus*
 Growing on wood of hardwood trees See *Fomes fraxineus*
6. Spores brown; pileus hirsute or hispid *P. hispidus*
 Spores hyaline; pileus not more than tomentose 7
7. Sporophore pink or cherry-red where touched with KOH solution .. *P. nidulans*
 Sporophore black with KOH or unchanging 8
8. Pileus buff or pale orange; context uniform; on dead oak and chest-
 nut wood *P. croceus*
 Pileus white to somewhat flesh-colored; context duplex; on the wood
 of various hardwood species *P. fissilis*

SECTION III.

- Sporophore stipitate or sub-stipitate (*Figs. 1, 10, 12*). SUB-SECTION 12, p. 19
- Sporophore sessile or effused-reflexed (*Figs. 7, 9*), sometimes narrowed to a stem-like base but not stipitate.
- Pileus with a distinct firm crust under which the context is distinctly softer or of a different color. SUB-SECTION 13, p. 19
- Pileus not at all incrustated.
- Sporophore growing on or about stumps or trunks of coniferous trees. SUB-SECTION 14, p. 20
- Sporophore growing on wood of hardwood trees, often on living trunks.
- Context ochraceous or very pale brown. SUB-SECTION 15, p. 20
- Context yellowish-brown or darker.
- Context usually less than 7 mm. thick.
- Setae present in the hymenium. SUB-SECTION 16, p. 20
- Setae absent from the hymenium. SUB-SECTION 17, p. 21
- Context more than 7 mm. thick; sporophore large, 8-30 cm. broad. SUB-SECTION 18, p. 21

SUB-SECTION 12.

1. Pileus and stem more or less red-varnished, at least when young 2
- Pileus and stem not with a red varnish 3
2. Varnish finally disappearing on the pileus and becoming ochraceous or reddish-yellow *P. Curtisii*
- Varnish persistent *P. lucidus*
3. Context not more than 1 mm. thick 4
- Context more than 1 mm. thick 6
4. Pores large, averaging 1 mm. or more in diameter; spores 7-11x4-4.5 u. *P. fomicolus*
- Pores small, averaging 2 to 4 per mm.; spores 6-8x4.5-6 u 5
5. Surface of pileus usually shining and with silky striations, usually less than 3 cm. broad *P. cinnamomeus*
- Surface of pileus not shining, and usually 4 cm. or more broad *P. perennis*
6. Surface of pileus with a thin but distinct crust See *Fomes lobatus*
- Surface of pileus not at all incrustated 7
7. Context not darker than cinnamon in color; context hyphae much branched; stem less than 1 cm. thick *P. elegans*
- Context yellow-brown or darker; hyphae not much if at all branched 8
8. Setae present in the hymenium *P. circinatus*
- Setae absent 9
9. Context hyphae 4-6 u diameter; growing on the ground *P. perennis*
- Context hyphae 6-10 u or more diameter; growing on wood or from buried wood or at the bases of trees 10
10. Cystidia present in the hymenium; spores hyaline, 5.5-8.5x4-5 u *P. Schweinitzii*
- Cystidia none; spores dilutely colored, 8-12x4-6 u *P. Montagnei*

SUB-SECTION 13.

11. Sporophore consisting of many closely overlapping pilei, forming a sub-globose or cylindric mass with a central core, the individual pilei less than 1 cm. thick *P. graveolens*
- Sporophore not entirely as above 12

12. Pileus covered by a thin red varnish *P. lucidus*
 Pileus not red-varnished, rarely of reddish-brown color 13
13. Context ochraceous or cinnamon *P. planellus*
 Context rust-brown or darker 14
14. Growing only at the base of living oak trees; context 1.5-4 cm. thick;
 spores globose, smooth, hyaline; setae present *P. dryadeus*
 Growing on old logs and stumps; context less than 1 cm. thick; spores
 sub-globose, smooth, yellow, 4.5-6x3.5-4.5 u; setae present... *P. glomeratus*
 Growing on or around old dead stumps; context less than 1 cm. thick;
 spores ovoid, echinulate, brown; setae none See *Fomes lobatus*

SUB-SECTION 14.

15. Context pale brown to cinnamon-brown; pore surface nearly white when
 fresh *P. resinusus* var. *benzoinus*
 Context rusty-brown or darker; pore surface not white when fresh 16
16. Clavate or cylindric cystidia present in the hymenium; spores 6-8x4-5 u
P. Schweinitzii
 Setae present in the hymenium 17
 Neither cystidia nor setae in the hymenium; spores 9-12x3-5 u
 See *Trametes americana*
17. Hyphae of context with cross walls; context distinctly duplex *P. circinatus*
 Hyphae of context without cross walls; context not at all duplex 18
18. Setae 5-9 u diameter, attenuate to a long narrow tip; spores cylindric,
 5-8x1.5-2 u See *Fomes tenuis*
 Setae 9-15 u diameter, more blunt pointed; spores globose, 5-6x3.5-5 u
 See *Fomes Pini* var. *Abietis*

SUB-SECTION 15.

19. Pileus 0.5 cm. or more thick when mature 20
 Pileus less than 0.5 cm. thick 21
20. Pileus hirsute or hispid; pores averaging 1 to 2 per mm. ... See *Trametes hispida*
 Pileus velvety to glabrous; pores averaging 3 to 6 per mm. *P. resinusus*
21. Pores averaging 5 to 6 per mm.; pileus only 1-2 mm. thick *P. planellus*
 Pores averaging 1 to 4 per mm.; pileus usually 2-5 mm. thick,
 See *Trametes mollis*

SUB-SECTION 16.

22. Setae imbedded in the pore tissue and in the context as well as between
 the basidia; pores greenish-yellow when fresh *P. glomeratus*
 Setae found only between the basidia 23
23. Largest hyphae of the context 2.5-6 u diameter 25
 Largest hyphae of the context 6-10 u diameter 24
24. Spores 6-7.5x4-6 u; pileus with no evidence of a central core; usually
 on hosts other than aspen *P. cuticularis*
 Spores 4.5-6x4-4.5 u; pileus with some slight evidence of a central core
 as in *P. dryophilus*; on aspen only *P. dryophilus* var. *vulpinus*
25. Sporophore hard and woody; pileus distinctly tomentose on the margin
 See *Fomes conchatus*
 Sporophore soft or firm but not hard and woody; pileus not tomentose.. 26

26. Setae 6-12 u diameter; pores averaging 4 to 5 per mm.; usually on alder or birch *P. radiatus*
 Setae 4-6 u diameter; pores averaging 6 to 8 per mm.; on all kinds of hardwoods *P. gilvus*

SUB-SECTION 17.

27. Sporophore immediately purple or red where touched with KOH solution; spores hyaline, 3-4x2-3 u *P. nidulans*
 Sporophore black with KOH solution; spores brown, 4.5-7x4-4.5 u *P. dryophilus* var. *vulpinus*

SUB-SECTION 18.

28. Setae present, but only in the basidial layer 29
 Setae present in the basidial layer and also in the tissue of the pore walls and in the context *P. glomeratus*
 Setae none *P. nidulans*
 29. Pileus with a central basal core of different texture than the context *P. dryophilus*
 Pileus context homogeneous 30
 30. Pileus glabrous; spores hyaline 31
 Pileus pubescent; spores hyaline *P. gilvus*
 Pileus distinctly pubescent; spores brown 32
 31. Pileus with a thin crust; growing only on living oak trees *P. dryadeus*
 Pileus not incrustated; growing on dead wood of all kinds *P. gilvus*
 32. Spores 7.5-10x6.5-9 u *P. hispidus*
 Spores 5.5-7.5x4-6 u *P. cuticularis*

RESUMÉ OF SPECIES

Polyporus abietinus (Dicks.) Fries. A thin, white, sessile, pubescent, coriaceous species, sometimes lavender on the lower surface, with allantoid hyaline spores 5-7.5x2-3 u, and small *capitate-incrusted cystidia* in the hymenium. Usually on wood of coniferous trees. Common. Compare *P. pargamenus*.

Var. Abietis (Lloyd) n. comb. As in the species but the hymenium lamellate.

Polyporus admirabilis Peck. A rather large (10-30 cm.), stipitate, white or gray species with elongate, hyaline spores 7.5-9x2.5-3.5 u. Cystidia none. On wounds in living hardwood trees or at the bases of living trees. Rare. Compare *P. Berkeleyi*.

Polyporus adustus (Willd.) Fries. A thin sessile species, white or gray above, blackish below, with oblong spores 3.5-5x2-3 u. Cystidia none. On dead wood of deciduous trees. Common. Compare *P. fumosus*.

Polyporus albellus Peck. A small, sessile, white, soft and watery, nearly glabrous species with pleasant odor. Spores allantoid, hyaline, 3.5-5x1-1.5 u. Cystidia none. Hyphae of context very much branched. On dead wood of hardwood trees. Common. Compare *P. tephroleucus*, *P. galactinus*, *P. spumeus*. Frequently known as *P. chioneus* Fries.

Polyporus amorphus Fries. A thin, sessile, species white above and orange below, with allantoid, hyaline spores 4-5x1-1.5 u. Cystidia none. On dead wood of coniferous trees. Not common. Compare *P. dichrous*.

Polyporus anceps Peck. A rather small species, sessile, white or whitish throughout, with hyaline, cylindric spores 7-10x2-3 u. Cystidia none. Hyphae of context dendritically branched. On dead wood of coniferous trees. Not common.

Polyporus arcularius (Batsch) Fries. A small, thin, centrally stipitate species with golden-brown or dark brown pileus, and large hexagonal pores 1 mm. diameter. Spores cylindric, hyaline, 7-11x2-3 u. Cystidia none. On dead wood of hardwood trees. Common. Compare *P. brumalis* and *Favolus canadensis*.

Polyporus balsameus Peck. A small, sessile, watery species, drying pale brown above, otherwise white, with minute oblong spores 3-4x2-2.5 u. and small inconspicuous cystidia. On dead wood of coniferous trees. Rare in Pennsylvania.

Polyporus Berkeleyi Fries. A large (15-30 cm.) stipitate species, whitish to grayish or alutaceous, with hyaline, globose, echinulate spores, 3.5-7.5 u diameter. Cystidia none. At the bases of stumps or living trees, especially oaks. Not common. Compare *P. frondosus* and *P. giganteus*.

Polyporus betulinus (Bull.) Fries. A medium-sized, sessile or umbonate attached species with pale brown convex upper surface and downward-extended pileus margin. Spores cylindric, hyaline, 3.5-5x1 u. Cystidia none. On living or dead birch trees. Common in some parts of the state; rare in the central mountainous section.

Polyporus biformis. (K1.) Berk. A small or medium-sized sessile species, whitish but drying alutaceous, with radiating pileus fibrils. Pores rather large, their walls usually lacerate. Spores cylindric, hyaline, 6-8x2-2.5 u. Cystidia none. On dead wood of hardwood trees. Not common in the central mountainous section; probably not rare in the western and southeastern sections of the state. Compare *Trametes sepium*.

Polyporus borealis Fries. A rather large (10-15 cm.), sessile, white, soft and watery species with ovoid or ellipsoid spores 4.5-7x3.5-5 u. and with fusoid cystidia in the hymenium. On trunks or from roots of living coniferous trees. Not common. Compare *P. guttulatus*.

Polyporus brumalis (Pers.) Fries. A small centrally stipitate species with brown to blackish pileus, small pores, and spores cylindric, hyaline, 5-7x1.5-2.5 u. Cystidia none. On dead wood of hardwood trees. Common in fall and winter. Compare *P. arcularius*.

Polyporus caeruleoporus Peck. A small centrally stipitate species, indigo blue throughout, with spores sub-globose, hyaline, 4-5x3-4 u. Cystidia none. On the ground in damp woods. Rare.

Polyporus caesius (Schrad.) Fries. A small, white, soft, sessile species, white or with a gray-blue tinge, strongly pubescent, and with spores allantoid, hyaline, 3-5x0.7-1 u. Cystidia none. On dead wood of both hardwood and coniferous trees. Rather common in the mountainous sections of the state. Compare *P. albellus*, *P. tephroleucus*, and *P. fumidiceps*.

Polyporus cinnabarinus (Jacq.) Fries. A small, thin, sessile, cinnabar-red species with short-cylindric hyaline spores 4.5-6x2-3 u. Cystidia none. On dead wood of hardwood (rarely coniferous) trees. Common. Compare *P. sanguineus* of the southern bordering states, and *P. fibrillosus*.

Polyporus cinnamomeus (Jacq) Saccardo. A small (1-3 cm.), thin, brown, centrally stipitate species with small pores and hyaline or pale brown oblong-ellipsoid spores, 6-8x4.5-6 u. Cystidia none. On the ground in wooded regions. Common. Compare *P. perennis* and *P. foeticolus*.

Polyporus circinatus Fries. A variable species, centrally stipitate on roots, sessile on stumps and trunks, bright ochraceous to rusty brown, with duplex context. Spores hyaline or pale brown, oblong-ellipsoid, 4-6x3-5 u. Setae present, the tips not curved. On stumps, trunks, or roots of living or dead coniferous trees. Compare *P. Schweinitzii*.

Var. dualis (Peck) n. comb. As in the species, but setae with strongly curved or hooked apices.

Polyporus compactus Overholts. Producing a poorly developed, nodulose, whitish

sporophore with *disagreeable odor*, and spores ellipsoid or ovoid, 7.5-9x4.5-6 u; also with *chlamydospores* 6-7.5 u diameter on the context hyphae. Cystidia none. On dead trunks or stumps of oak. Not common.

Polyporus conchifer (Schw.) Fries. A small, sessile or substipitate, *thin, white* species, at certain stages with a small *brown cup-like body* at the base of the pileus, and with spores cylindric, hyaline, 5-7x2-3 u. Cystidia none. On dead *elm* branches. Common. Compare *P. pubescens*.

Polyporus confluens (Alb. & Schw.) Fries. A medium-sized or large, centrally stipitate, fleshy-tough species with *buff or reddish pileus* and pore surface *changing to red in dried plants*. Spores ellipsoid, hyaline, 3-4.5x2.5-3 u. Cystidia none. On the ground in woods. Not yet collected in Pennsylvania but known from adjoining states. Compare *P. griseus* and *P. ovinus*.

Polyporus cristatus (Pers.) Fries. A medium-sized, stipitate species, with *yellowish-green, areolate pileus*, and spores sub-globose, hyaline, 4-6x3.5-4.5 u. Cystidia none. On the ground in wooded areas. Common in wet summers.

Polyporus croceus (Pers.) Fries. A rather large, sessile, *thick, buff or orange-colored*, watery species with a *concolorous, zonate* context, and spores ovoid or ellipsoid, hyaline, 4-6x3-4 u. Cystidia none. On living or dead trunks of *oak* and *chestnut*. Not common. Compare *P. fissilis*.

Polyporus Curtisii Berk. A medium-sized, stipitate, *corky* species, with *ochraceous*, somewhat *incrusted pileus*, with partly brown and corky context, and spores brown, ovoid with a *truncate apex*, apparently *echinulate*, 9-12x5-7 u. Cystidia none. On stumps and roots of hardwood trees. Rare and only in the southern part of the state. Compare *P. lucidus*.

Polyporus cuticularis (Bull.) Fries. A medium-sized, sessile, watery, rather thick species, *brown throughout*, and with spores ellipsoid to sub-globose, brown, 5.5-7.5x4-6 u. *Setae present* but often not abundant. On dead wood and from wounds in living hardwood trees. Rather common. Compare *P. dryophilus* and *P. hispidus*.

Polyporus delectans Peck. A rather large, sessile, rather thick, white, watery species with *pores nearly 1 mm. diameter* and with spores sub-globose smooth, hyaline, 5-7x4-5.5 u. Cystidia none. On dead wood and from wounds in living hardwood trees. Rather common. Compare *P. spumeus*, *P. galactinus*, and *P. obtusus*.

Polyporus dichrous Fries. A small, *thin*, sessile species with white pileus and *reddish-purple to purplish-black* pore surface, the *tubes peeling readily* in a thin elastic layer. Spores allantoid, hyaline, 3-4.5x0.5-1 u. Cystidia none. On dead wood, usually of hardwood trees. Common. Compare *P. amorphus*.

Polyporus distortus (Schw.) Fries. A very variable species, sometimes *nodulose and distorted*, sometimes well developed and stipitate, white or whitish, small or medium-sized, with *duplex context* and spores ellipsoid or ovoid, hyaline, 5-7.5x3-5 u; sometimes with *chlamydospores* 5-8 u diameter. *Cystidia cylindric*, not conspicuous, 5-10 u diameter. About stumps and trunks of deciduous trees. Rare in the central mountainous regions, but probably more common in the lowlands.

Polyporus dryadeus Fries. A large, sessile, thick, *corky* species, pale brown throughout, *slightly incrusted*, with spores globose, hyaline or pale-colored, 6-8 u diameter. *Setae present*, conical, often not abundant. At the *base* of living oak trees. Not common. Compare *P. dryophilus*.

Polyporus dryophilus Berk. A rather large, sessile, thick, soft-corky species, pale brown or brown throughout, with a *globose basal core*, and spores ellipsoid to sub-globose, brown, 6-8x5-6 u. *Setae none*. On the *upper part* of the trunks of living oaks. Rather common. Compare *P. dryadeus* and *P. hispidus*.

Var. vulpinus (Fries) n. comb. Pileus more appurante and of small size, nearly or quite lacking the basal core, and spores 4.5-7x3.5-4.5 u. *Setae none*. On dead trunks of aspen. Rather common. Compare *P. cuticularis*.

Polyporus elegans (Bull.) Fries. A small (2.5 cm.), leathery, thin, stipitate, tan-colored species, with *black stem* and with spores cylindric, hyaline, 6-10x2.5-3.5 u. Cystidia none. On dead wood, usually of deciduous trees. Common in the mountainous sections of the state. Compare *P. picipes*.

Polyporus fagicolus Murrill. A small, *thin, tough, white* stipitate species with spores cylindric, hyaline, 10-14x4-5.5 u. Cystidia none. On logs of hardwood trees. Rare. Compare *P. arcularius*.

Polyporus fibrillosus Karst. A small, *rather thin*, sessile species, *saffron or orange-red* throughout, with spores short-cylindric, hyaline, 5-10x2.5-5 u. Cystidia cylindric, conspicuous, 3-4.5 u diameter. On dead wood, nearly always of coniferous trees. Rare. Compare *P. cinnabarinus*.

Polyporus fissilis Berk. A rather large, sessile, thick, *white* (drying discolored reddish), species with *strongly zonate* context, and spores ovoid or ellipsoid, hyaline, 3.5-4.5x3-3.5 u. Cystidia none. Usually from *wounds* in living deciduous trees. Rare. Compare *P. croceus*, *P. delectans*, *P. spumeus*.

Polyporus floriformis Quel. A small, (1.4 cm.) thin, *sub-stipitate, white* species with spores oblong-ellipsoid, hyaline, 3-4x2.5-3 u. Cystidia none. On dead wood of coniferous trees. Rare. Compare *P. semisupinus* and *P. balsameus*.

Polyporus fomicolus Berk. & Curt. A thin, small (2.5 cm.), centrally stipitate, uniformly brown species with *pores 1 mm. or more* diameter and spores short-cylindric, hyaline or nearly so, 7-11x4-4.5 u. Cystidia none. On the ground in *burned-over areas*. Not yet collected in Pennsylvania but known to occur in adjoining states. Compare *P. Montagnei*, *P. cinnamomeus*, and *P. perennis*.

Polyporus fragilis Fries. A small, thin, white, sessile, soft and watery species, discoloring yellowish where handled and reddish on drying, with spores allantoid, hyaline, 3-5x1-1.5 u. Cystidia none. On dead wood of coniferous trees. Not common.

Polyporus frondosus (Dicks.) Fries. A large, stipitate species forming imbricate clusters 20-60 cm. broad, whitish or grayish, *not blackening on drying*, with spores ellipsoid or ovoid, smooth, hyaline, 5-7x3.5-5 u. Cystidia none. Around stumps or trunks of hardwood trees. Common. Compare *P. giganteus* and *P. Berkeleyi*.

Polyporus fumidiceps Atkinson. A small, sessile, *soft and watery species* with *pleasant odor* and decidedly gray glabrous pileus. Spores minute, globose, hyaline, 2.5-3.5x2-2.5 u. Cystidia none. On dead wood of hardwood trees. Not uncommon in the lowland regions. Compare *P. albellus*, *P. tephroleucus*, and *P. galactinus*.

Polyporus fumosus (Pers.) Fries. A small or medium-sized, sessile, thin, white to gray or pale tan species, *nearly glabrous*, with *somewhat smoky* or blackish pore surface, and with a *narrow dark line separating the tubes from the context*. Spores ellipsoid or oblong, hyaline, 4.5-6x2.5-3 u. Cystidia none. On dead wood of hardwood trees. Common. Compare *P. adustus*.

Polyporus galactinus Berk. A small or medium-sized, sessile, white, *sweet scented, soft and watery species* with *strigose-tomentose* pileus and spores minute, ellipsoid, hyaline, 2.5-3.5x2-3 u. Cystidia none. On dead wood of hardwood trees. Common. Compare *P. fumidiceps*, *P. albellus*, *P. spumeus*, and *P. tephroleucus*.

Polyporus giganteus (Pers.) Fries. A large, stipitate, white or gray species forming imbricate clusters 15-40 cm. diameter, the margins and pore surface black where bruised and on drying, with spores sub-globose, smooth, hyaline, 4-6 u diameter. Cystidia none. On the ground around stumps of hardwood trees. Rather common. Compare *P. frondosus* and *P. Berkeleyi*.

Polyporus gilvus (Schw.) Fries. A small or medium-sized, thin, sessile, brown glabrous, rather hard species, with spores oblong-ellipsoid, hyaline, 4-5.5x2.5-3 u. Setae abundant, 3-6 u diameter. On dead wood, usually of hardwood trees. Common. Compare *P. radiatus*, *P. cuticularis*, *P. nidulans*, and *P. glomeratus*.

Polyporus glomeratus Peck. A small or medium-sized, sessile or resupinate, firm, yellow-brown or greenish-yellow, species with spores sub-globose, greenish-yellow, 4.5-6x3.5-4.5 u. Setae present, and seta-like hyphae 8-12 u diameter buried in context and pore walls. On dead wood of hardwood trees. Not common. Compare *P. radiatus* and *P. cuticularis*.

Polyporus graveolens (Schw.) Fries. A medium-sized, sessile, firm, brown species growing in sub-globose or elongated clusters of small closely overlapping and slightly incrustated pilei, all from a central granular core. Spores cylindric, hyaline to pale brown, 9-12.5x3-4.5 u. Cystidia none. On dead wood or on trunks of living hardwood trees. Not common.

Polyporus griseus Peck. A centrally stipitate, medium-sized, sub-fleshy species, white to gray or smoky, and with tuberculate spores 5-6.5 u diameter. Cystidia none. On the ground in wooded areas. Rare. Compare *P. cristatus*, *P. confluens*, and *P. ovinus*.

Polyporus guttulatus Peck. A sessile or laterally sub-stipitate, small or medium-sized, thin, cheesey, white species with upper surface glabrous and marked with circular depressed spots, and spores oblong-ellipsoid, hyaline, 3-4.5x2-2.5 u. Cystidia none. On dead wood, usually of coniferous trees. Frequent. Compare *P. floriformis*.

Polyporus hirsutus (Wulf.) Fries. A thin, sessile, coriaceous, gray to brownish, hirsute-tomentose species, with spores cylindric, hyaline, 4.5-6.5x2-2.5 u. Cystidia none. On dead wood, usually of hardwood trees. Common. Compare *P. pubescens*, *P. versicolor*, *P. velutinus*, and *P. pargamenus*.

Polyporus hispidus (Bull.) Fries. A large, thick, sessile, spongy, hirsute species, brown throughout and with spores broadly ellipsoid or sub-globose, brown, 7.5-10x6.5-9 u. Setae present, sometimes few, 6-8 u diameter. On living trunks of hardwood trees. Frequent. Compare *P. cuticularis* and *P. dryophilus*.

Polyporus immitus Peck. A small to medium-sized, sessile, soft, watery, white species with spores short-cylindric, hyaline, 3-4x1-2 u. Cystidia none. On dead wood of both hardwood and coniferous trees. Rare. Compare *P. guttulatus* and *P. galactinus*.

Polyporus lapponicus Romell. A small, rather thick, watery-tough, sessile species, whitish, drying rufescent, strigose-tomentose, with spores cylindric, hyaline, 7-11x3-3.5 u. Cystidia present, projecting, 4-9 u diameter. On dead wood of coniferous trees. Not yet collected in Pennsylvania but known from adjoining states. Compare *P. fragilis* and *P. borealis*.

Polyporus lucidus (Curt.) Fries. A medium-sized to rather large, sessile or stipitate, corky species with pileus and stem covered by a thin red crust, and with brown context and spores brown, ellipsoid or ovoid, truncate at the apex, apparently punctate, 10-12x6-9 u. Cystidia none. At the base of living hardwood trees or on stumps or roots. Frequent. Compare *P. Curtisii* and *P. Tsugae*.

Polyporus melanopus Fries. A small or medium-sized, centrally stipitate, tough species with pale brown or brown pileus, white pore surface, and stem black at the base. Spores cylindric, hyaline, 8-12x3.5-4 u. Cystidia none. On the ground, attached to buried wood of hardwood trees. Not yet collected in Pennsylvania but known from adjoining states. Compare *P. radicans* and *P. picipes*.

Polyporus Montagnei Fries. A small or medium-sized (2-10 cm.), stipitate, thin species, brown throughout with pores 1 mm. or more diameter, with spores elongate-ellipsoid, hyaline or pale colored, 8-12x4.5-6 u. Setae none. On the ground, probably always attached to buried coniferous wood. Rare. Compare *P. perennis* and *P. circinatus*.

Polyporus nidulans Fries. A small or medium-sized, sessile, soft and watery, uniformly pale brown species with spores ellipsoid to sub-globose, hyaline, 3-4x2-3 u. Cystidia none. On dead wood of hardwood trees. Rather common. Compare *P. gilvus* and *P. radiatus*.

Polyporus obtusus Berk. A medium-sized to large, white, sessile species, thick and spongy, with tubes 1.5-3 cm. long and pores 1 mm. or more diameter. Spores broadly ellipsoid to sub-globose, hyaline, 5-7x4-5 u. Cystidia none. On living trunks of oak; occasionally on other hosts. Rare. Compare *P. delectans* and *P. fissilis*.

Polyporus osseus Kalchbr. A small or medium-sized, stipitate or sub-stipitate, white or gray species, drying very hard and bone-like, with spores short-cylindric or allantoid, hyaline, 4-6x2-2.5 u. Cystidia none. On dead wood of coniferous trees. Compare *P. guttulatus*.

Polyporus ovinus (Schaeff.) Fries. A medium-sized, centrally stipitate, fleshy-tough species, white or whitish throughout but often drying more or less smoky-olivaceous, the stem not black at the base. Spores broadly ellipsoid to sub-globose, smooth, hyaline, 3.5-4x2.5-3.5 u. Cystidia none. On the ground under coniferous trees. Not yet collected in Pennsylvania, but known from adjoining states. Compare *P. griseus* and *P. confluens*.

Polyporus pargamensis Fries. A small, thin, white or pallid, coriaceous, sessile, usually zonate species, villose-tomentose, with pore surface soon much toothed and often lavender in color, and with spores cylindric, hyaline, 5-6.5x2-2.5 u. Cystidia inconspicuous, with apices capitate-incrusted. On dead wood, usually of hardwood trees. Common. Compare *P. versicolor*, *P. hirsutus*, *P. velutinus*, and *P. pubescens*.

Polyporus perennis (Linn.) Fries. A small or medium-sized (2-10 cm.), centrally stipitate, thin species, brown throughout, with small pores and with spores oblong-ellipsoid, hyaline or nearly so, 6-9x3-5 u. Cystidia none. On the ground in wooded regions. Common. Compare *P. cinnamomeus*, *P. Montagnei*, and *P. focicola*.

Polyporus picipes Fries. A medium-sized or rather large, thin, centrally stipitate, leathery species with hazel to blackish upper surface, black stem, and with spores cylindric, hyaline, 6-8x3-4 u. Cystidia none. On dead wood, usually of hardwood trees. Common. Compare *P. elegans*.

Polyporus planellus (Peck) Saccardo. A very small, thin, usually mostly resupinate, coriaceous species, brown and zonate above, with minute pores, and spores cylindric, hyaline, 9-12x3.5-5 u. Cystidia none. On dead limbs of hardwood trees. Not yet collected in Pennsylvania but known from adjoining states.

Polyporus poculus (Schw.) Berk. & Curt. A very small (1-5 mm.), sub-stipitate, pendent, pallid to brown species with spores allantoid, hyaline, 3-4x1 u. Cystidia none. On fallen hardwood trunks, especially of oak. Rather common. Compare *Fomes scutellatus*.

Polyporus pubescens (Schum.) Fries. A small, sessile, coriaceous, thin, finely pubescent, radiate-striate, watery species, white throughout, the pore surface not toothed, and with spores cylindric, hyaline, 4-6x1.5-2.5 u. Cystidia none. On dead wood of deciduous trees. Common. Compare *P. hirsutus*, *P. versicolor*, *P. velutinus*, and *P. pargamensis*.

Var. Grayii Cooke. Glabrous, drying uniformly ochraceous-tan or pale tawny, the pores more regular and thicker walled. On dead wood of deciduous trees. Rare.

Polyporus radiatus (Sow.) Fries. A small, thin, coriaceous-watery, fibrillose species, brown throughout, with spores ellipsoid, hyaline, 4-6x3-4 u. Setae present, bulbous at base. On dead wood of hardwood trees. Common on alder and birch in the mountainous regions; rare otherwise. Compare *P. cuticularis*, *P. glomeratus*, and *P. gilvus*.

Polyporus radicatus Schw. A medium-sized, centrally stipitate, fleshy-tough species with brown to sooty-brown velvety pileus, and long radicate black-based stem. Spores sub-fusiform, hyaline, 12-15x6-8 u. Cystidia none. Not yet collected in Pennsylvania but not uncommon in adjoining states. Compare *P. melanopus*.

Polyporus resinosus (Schrad.) Fries. A medium-sized or large, rather thick, sessile, watery species with uniformly dark brown or blackish brown radiate-rugose

and *velvety-tomentose* species with spores allantoid, hyaline, 4-7x1.5-2 u. Cystidia none. On old logs and stumps of hardwood trees. Common.

Var. benzoinus n. comb. As in the species but with blackish zones on the pileus and growing on wood of coniferous trees. Rare.

Polyporus robiniophilus (Murrill) Lloyd. A medium-sized or large, sessile, corky, thick species, white throughout, with spores ovoid to sub-globose, hyaline, 6-9x5.5-7 u. Cystidia none. On living trunks of hardwood trees, especially of black locust. Not common. Compare *Trametes suaveolens*.

Polyporus Schwecinitzii Fries. A medium-sized or large, stipitate or sessile, rather thick, tomentose species, rusty-brown throughout or brighter when young, and with spores ellipsoid or ovoid, hyaline or brown, 5.5-8.5x4-5 u. Cystidia present, not abundant, projecting strongly, 7-10 u diameter. On or about trunks or roots of living coniferous trees. Frequent. Compare *P. circinatus*.

Polyporus semipileatus Peck. A small, tough, sessile or sub-resupinate, thin species, white throughout, with spores allantoid, hyaline, 2.5-3.5x0.5 u. Cystidia none. On dead wood of hardwood trees. Common. Compare *P. albellus* and *P. semisupinus*.

Polyporus semisupinus Berk. & Curt. A small (0.5-2.5 cm.), sessile or sub-stipitate, very thin species of cartilaginous consistency and white throughout, but drying bay, with spores ellipsoid, hyaline, minute, 2.5-3x2-2.5 u. Cystidia none. On dead wood of hardwood trees, especially birch. Rather common. Compare *P. semipileatus* and *P. floriformis*.

Polyporus Spraguei Berk. & Curt. A medium-sized or rather large, white, sessile, watery, rather thick species, with disagreeable odor, drying very hard and often blackening on the margin, with spores ovoid, hyaline, 5-7.5x4-6 u. Cystidia none. On dead wood of hardwood trees, especially oak and beech. Rather common.

Polyporus spumeus (Sow.) Horne. A medium sized or large, sessile, soft, watery species, white throughout, with small pores, and with spores sub-globose, hyaline, 5-7 u diameter. Cystidia none. On old hardwood logs, or more rarely from wounds in living trees. Rather common. Compare *P. galactinus*, *P. albellus*, and *P. delectans*.

Var. malicolicus Lloyd. Thinner and drying harder, with spores 3-4.5 u diameter. On wounds in living hardwood trees. Common.

Polyporus squamosus (Huds.) Fries. A medium-sized or large, stipitate, tough species, light colored but with large appressed brownish scales and pores 1 mm. or more in diameter. Spores elongate, hyaline, 10-15x4-6 u. Cystidia none. Growing from wounds in living deciduous trees. Rare.

Polyporus sulphureus (Bull.) Fries. A large, sessile or sub-stipitate, imbricate, fleshy or cheesy species with bright orange pileus and sulphur-yellow pore surface. Spores ellipsoid or ovoid, hyaline, 5-7x3.5-4.5 u. Cystidia none. On stumps and logs or on trunks of living hardwood or coniferous trees. Common.

Var. cinnamatus (Morgan) n. comb. With salmon-colored pileus and white pore surface, and producing a pseudo-sclerotium in the ground at the bases or on the roots of living hardwood trees. Common.

Polyporus tephroleucus Fries. A small or medium-sized, soft and watery, nearly glabrous, rather thin species, entirely white or gray throughout and pleasantly scented, with hyphae of context parallel and simple, and with allantoid hyaline spores, 3-5x0.7-1.5 u. Cystidia none. On dead wood of hardwood trees. Frequent. Compare *P. albellus* and *P. galactinus*.

Polyporus Tsugae (Murrill) Overholts. A medium-sized or immense, stipitate, corky species with a red (often shining) incrustated pileus and nearly white context. Spores ovoid with a truncate apex, brown, apparently echinulate, 9-11x6-8 u. Cystidia

none. On stumps and logs of *coniferous* trees. Common. Compare *P. lucidus* and *P. Curtisii*.

Polyporus Tulipiferus (Schw.) Overholts. A small, *thin*, sessile or *resupinate*, *pure white* species with *rather large pores* whose walls soon become *strongly toothed*, and with spores short-cylindric, hyaline, 4.5-6x2-3 u. *Cystidia incrusted*, projecting, 6-8 u diameter. On dead wood, nearly always of hardwood trees. Common.

Polyporus umbellatus (Pers.) Fries. Growing in medium-sized or large (10-20 cm.) clusters of *many small*, fleshy-tough, *pale brown* pilei on *cylindric stem branches*, the whole produced from a large underground sclerotium. Spores *cylindric*, hyaline, smooth, 7-9.5x2.5-3.5 u. *Cystidia* none. On the ground about stumps of hardwood trees. Rare. Compare *P. frondosus*, *P. giganteus*, and *P. Berkeleyi*.

Polyporus undosus Peck. A small *thin*, coriaceous, usually *partly resupinate*, *white* species with *irregular lacerate* pores measuring 0.5-1 mm. diameter, and with spores cylindric, hyaline, 4-6x1-1.5 u. *Cystidia* none. On dead wood of *coniferous* trees. Not yet collected in Pennsylvania but known in adjacent states.

Polyporus velutinus Fries. A small, thin, coriaceous, *velvety-pubescent*, *zonate* species, whitish, ochraceous, or brownish in color and usually with *smoky pore surface* and spores cylindric, hyaline, 5-7x2.5 u. *Cystidia* none. On dead wood of hardwood trees, especially *aspen*. Not yet collected in Pennsylvania but known from adjoining states.

Polyporus versicolor (Linn.) Fries. A small, sessile, coriaceous, *velvety-pubescent*, *multi-zonate* and *multi-colored* species with *even* pore surface and spores cylindric, hyaline, 4-5x1.5-2 u. *Cystidia* none. On dead wood or on wounded areas of both hardwood and *coniferous* trees. Common. Compare *P. pargamenus*, *P. hirsutus*, and *P. velutinus*.

Polyporus volvatus Peck. A small, *sub-globose*, sessile, sub-corky, glabrous, *tan-colored* or ochraceous species with the *pore surface covered* with and concealed by a thick membrane with a *perforation* near the base. Spores cylindric, hyaline, 8-10.5x3-5 u. *Cystidia* none. On dead or dying trunks of *coniferous* trees. Rather common.